

The Journal of the American Association of Zoo Keepers, Inc.

Animal Care



March 2018, Volume 45, No. 3



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65 ABOUT THE COVER

66 FROM THE PRESIDENT

68 COMING EVENTS

69 ANNOUNCEMENTS

70 AAZK CONFERENCE

FEATURED ARTICLES

72-75

The Side Effects of Climate Change
on *Panthera tigris*

Lauren Zager

76-78

Bioparque Amaru: Conserving
Ecuadorian Wildlife

Kathryn Juliano

80-81

How to Love Your Dream Job

Heather Kalka

TRAINING TALES

82-84

Injection Training 3.0 Alpacas at
the Smithsonian National Zoo

Kathryn Juliano



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The American Association of Zoo Keepers, Inc. exists to advance excellence in the animal keeping profession, foster effective communication beneficial to animal care, support deserving conservation projects, and promote the preservation of our natural resources and animal life.

ABOUT THE COVER

This month's cover comes to us from Katie Alexander, a Keeper II at the Chattanooga Zoo. The photo features a female Greater One-Horned Rhino (*Rhinoceros unicornis*) at the Mesker Park Zoo.

"Greater one-horned rhino numbers have recovered from fewer than 200 earlier in the 20th century to as many as 3,550 today, thanks to strict protection from Indian and Nepalese wildlife authorities. The greater one-horned rhino is one of the two greatest success stories in rhino conservation. However, poaching pressure remains high. The species' recovery is still precarious and depends on effective conservation efforts throughout its range (rhinos.org)."

One of the best ways to support this species is through Bowling for Rhinos, AAZK's flagship conservation program. Go to Page 85 of this month's issue of the AKF to learn more about how you and your local AAZK Chapter can participate in Bowling for Rhinos and help us achieve our goal of raising \$700,000 in 2018 for rhino conservation.

Articles sent to **Animal Keepers' Forum** will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for **AKF**. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the Editor. The Editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone, fax or e-mail contributions of late-breaking news or last-minute insertions are accepted as space allows. Phone (330) 483-1104; FAX (330) 483-1444; e-mail is shane.good@aazk.org. If you have questions about submission guidelines, please contact the Editor. Submission guidelines are also found at: aazk.org/akf-submission-guidelines/.

Deadline for each regular issue is the 3rd of the preceding month. Dedicated issues may have separate deadline dates and will be noted by the Editor.

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My professional career has been enhanced by my membership with AAZK. Three words come to mind when I think about this; passion, pride and professionalism. Collectively they represent my reasons for joining AAZK more than 20 years ago and still ring true today.

My passion for animals and wildlife comes from my family. I first credit my mom for cultivating this passion. Because of her influence, I fell in love with horses at a young age and my parents gave me the opportunity to pursue my dream of competing at the national level. If I think about it now, not only did I learn to ride and make a connection with horses but I also developed my skills regarding husbandry, mucking stalls, diet prep and behavioral enrichment. I also credit my grandfather, who served on the Board of Directors for a zoo for many years. He kept me engaged with the idea that I could do more for wildlife. He shared the zoo newsletters with me and took me to events at the Zoo. He helped support me in my first trip to Kenya, and to this day he is huge supporter of Bowling for Rhinos. He guided me down the path that I'm still on today, and I'm so grateful.

I became a student member of AAZK as a sophomore in college because I wanted a connection to the profession and it offered many resources as I prepared for future employment. When I got my first job as a zookeeper I knew I was joining the ranks of a group of individuals who would challenge me to increase my knowledge. This resulted in a profound impact on my level of animal care and my involvement with wildlife conservation. As my first job became a career filled with incredible networking and professional opportunities, my pride as a zoo professional kept growing. I looked forward to the monthly Animal Keepers' Forum and to attending the AAZK National Conference as often as I could. When I had the chance to contribute to AAZK at the National level as a Committee Chair and eventually as a member of the Board of Directors it was a culmination of professionalism for me.

How did you become involved in AAZK? What are your three words? And who would you credit for shaping your path towards the profession? I think it's so important for us to know what keeps us engaged so that we can relate to one another and also so we can share our passion with others to help our membership grow.

I'd love to hear from you.

All the best,

A handwritten signature in black ink, appearing to read "Bethany".

Bethany
Bethany.Bingham@aazk.org



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e-mail shane.good@aazk.org

April 8-13, 2018
Animal Behavior
Management Alliance
(ABMA) Annual Conference
San Antonio, TX
Hosted by San Antonio Zoo and Sea World San Antonio
For more information go to: theabma.org/abma-annual-conference/

April 10 or 11, 2018
(*same workshop held each day)
Ape Cardio Health Workshop
Waco, TX
Hosted by Cameron Park Zoo
For more information contact: orangutan@wacotx.gov

May 4-6, 2018
Recon: Reconnecting with Elephants in Restricted Contact.
Colorado Springs, CO
Hosted by Cheyenne Mountain Zoo
For more information go to: cmzoo.org/index.php/recon-elephant-workshop/

May 7-11, 2018
Practical Zoo Nutrition Management
Front Royal, VA
Hosted by Smithsonian-Mason School of Conservation and National Zoological Park. Go to: smconservation.gmu.edu/programs/graduate-and-professional/professional-training-courses/nutrition/

May 14-18, 2018
RAW: Regional Aquatics Workshop
Tampa, FL
Hosted by The Florida Aquarium
For more information go to: rawconference.org/index.html

August 23-25, 2018
International Symposium on Pangolin Care and Conservation
Brookfield, IL
Hosted by Chicago Zoological Society
For more information contact: amy.roberts@czs.org

September 23-27, 2018
AZA Annual Conference
Seattle, WA
Hosted by Seattle Aquarium and Woodland Park Zoo
For more information go to: aza.org/conferences-meetings#mym

October 14-18, 2018
International Congress on Zookeeping
Buenos Aires, Argentina
Hosted by Fundacion Temaiken and the International Congress of Zookeepers
For more information go to: iczoo.org/congress

October 15-20, 2018
Otter Keeper Workshop
Portland, OR
Hosted by Oregon Zoo
For more information go to: otterkeeperworkshop.org/



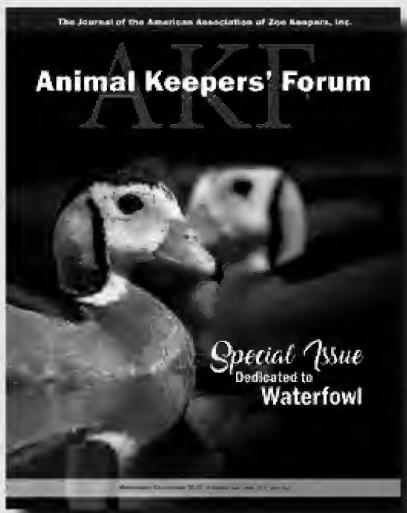
October 4-8, 2018
AAZK National Conference
Denver, CO

Hosted by the Rocky Mountain AAZK Chapter and Denver Zoo

rmaazk.org/2018-national-aazk-conference/

October 25-27, 2018
Waterfowl Conservation Workshop
Greenville, NC
Hosted by International Wild Waterfowl Association and Sylvan Heights Bird Park
For more information go to: waterfowlconservation.org

Special Issue Available for Purchase



The November/December 2017 issue of AKF dedicated to Waterfowl Husbandry is now available for purchase in the AAZK Gift Shop! Looking for extra copies for your staff, interns or co-workers?

Buy your copies today at <https://aazk.org/product-category/publications/>

ADD TO CART

2018 AAZK Awards Nominations Opened

The deadline for nominations is 1 May 2018

Information concerning the qualifications, nomination procedure, selection procedures and an explanation of the awards may be obtained at aazk.org under committees/awards.

If you have questions, please contact Janet McCoy at: [Awards@aazk.org](mailto:awards@aazk.org).

Lifetime Achievement - AAZK Professional Service Award

This award recognizes an individual's dedicated commitment to the animal care profession over the course of the nominee's career with significant contributions to the entire zoological community.

Lifetime Achievement - AAZK Meritorious Service Award

This award recognizes outstanding service or contribution with significant contributions to the entire zoological community; or recognition of specific and continued contribution to the American Association of Zoo Keepers.

The Lutz Ruhe Meritorious Achievement - AAZK Professional of the Year Award

This award recognizes professional members of AAZK, in good standing in the Association, for their day-to-day professionalism within their facility.

Jean M. Hromadka AAZK Excellence in Animal Care Award

This award recognizes achievement and determination of an individual or team in the animal care field and in fostering professionalism.

Excellence in Zoo Keeper Education Award

This award recognizes individuals, institutions and organizations in the zoological community most actively promoting educational programs for zoo keepers.

Excellence in Exhibit Renovation Award

This award recognizes institutions or organizations in the zoological community for the renovation of existing animal facilities which involved active keeper participation in the process.

AAZK Excellence in Animal Nutrition Award

This award recognizes individuals in the zoological community who have been actively involved in projects/studies/research concerning zoo/aquarium nutrition.

Lee Houts Advancement in Enrichment Award

This award recognizes outstanding keeper-initiated contributions to the art and science of environmental enrichment.

Nico van Strien Leadership in Conservation Award

This award recognizes outstanding AAZK member-initiated contribution to the conservation of wildlife and their habitats.



45th Annual AAZK National Conference

October 4-8, 2018

Registration is open now!

The deadline for early registration is **August 15th**.

Member Registration: \$260

Non-member Registration: \$360

Register before **May 15th** to be entered into a raffle for a \$100 Visa gift card!

Trail Guide

Thursday, October 4

Pre-Conference Trip

Icebreaker at Downtown Aquarium

Friday, October 5

Keynote Speaker: Temple Grandin

Paper Sessions

Workshops/Professional Certificate Courses

Town Hall Meeting

Conservation Rally

Saturday, October 6

Paper Sessions

Themed Papers

Workshops/Professional Certificate Courses

Poster Session

Awards Ceremony

Sunday, October 7

Zoo Day

Silent Auction

Monday, October 8

Paper Sessions

Workshops/Professional Certificate Courses

Closing Banquet

Tuesday, October 9

Post-Conference Trips

Apex of Activities



Icebreaker at Downtown Aquarium
Get to know your fellow conference attendees while watching rays, sharks, tigers, otters, and animal ambassadors!

Dr. Temple Grandin

This year's keynote speaker is a professor of Animal Science at CSU and a prominent author and speaker on both autism and animal behavior.



Awards Ceremony

Dig out your leg warmers, Prom attire, and Members Only jackets for our 80's award show themed ceremony.



Closing Banquet

Join us for our fun sports-themed banquet. Wear your favorite team jersey and be prepared for games, surprises, and more!

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Trips to Culminate Your Conference Experience



Pre-Trip- Cheyenne Mountain Zoo

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Post-Trip Option #1- The Colorado Outdoors Trip

Mt. Falcon hike, Red Rocks Amphitheatre, and a local brewery tour.

Hike Mt. Falcon on a 2.3 mile loop and take in several historic sites as well as breathtaking views of Denver, Red Rocks, and the Front Range. This is an easy hike and has a relatively flat and wide trail. After a day of hiking you'll get to relax and enjoy a tour of one of our local Colorado breweries!



Post-Trip Option #2- Rocky Mountain Arsenal Wildlife Refuge and National Wildlife Refuge Program Day Trip

The arsenal is a 15,000-acre expanse of prairie, wetland and woodland habitat that has transitioned from farmland, to war-time manufacturing site, to wildlife sanctuary. It is home to many species including bison, burrowing owls, and black-footed ferrets. The Repository is the only place in the United States where items that have been forfeited to the U.S. Fish and Wildlife Service are stored. Many of the items are donated to educational facilities, nonprofit organizations, and conservation agencies to aid in teaching about endangered species and other wildlife.

Post-Trip Option #3- Pueblo Zoo

Home to more than 400 animals and 120 species, the zoo covers twenty-five acres of Pueblo City Park. There is a tropical rain forest to visit and penguins to watch "flying" underwater. A shipwreck journey around the world is available in the Islands of Life building. Meet friendly farm animals in the Pioneer Ranch and watch northern river otters swim and frolic underwater. World of Color houses a variety of reptiles, turtles, tortoises, and birds.



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The Side Effects of Climate Change on *Panthera tigris*

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Abstract

Climate change is an issue worldwide. In the past, not all scientists could agree on what was happening to the Earth. However, the overwhelming evidence for climate change has led to the consensus that climate change is real. Some of the Earth's most iconic animal species are threatened by the changes that are occurring. Tigers are endangered due to habitat loss, prey deprivation, and poaching. Additionally, reviews of recent literature show climate change is affecting the habitats of tigers and that their behavior is affected as well. In the past, tigers consisted of nine different subspecies, but that number has potentially decreased to five. Conservation efforts to keep habitat loss, poaching and prey deprivation at minimum levels are even more crucial now that climate change is also a threat. Humans need to decrease carbon emissions and keep the Earth's temperature consistent. Survival of this species and many others depends on swift action.

Introduction

The human race puts about 110 million tons of pollution into the atmosphere every 24 hours, resulting in a tremendous amount of pressure on the Earth (Gore, 2016). Currently the atmosphere can trap as much energy that would be released by four hundred thousand Hiroshima class atomic bombs. That is equivalent to the bombs exploding every 24 hours, 365 days a year (Gore, 2016). Climate change is drastically affecting the Earth and while it has been the topic of numerous debates, scientists agree that climate change is indeed happening (Kuhn, 2010). From changing weather patterns to an increase in sickness, from insurance premiums seeing a steep increase to animals losing their habitats, climate change is displaying its devastating effects everyday (Tol, 2009; Costello et al., 2009).

The tiger (*Panthera tigris*) is a flagship species for a multitude of different environments around the world. Unfortunately, these amazing creatures may not be here for much longer. Just in the past decade, areas occupied by tigers have decreased by as much as 41 percent due to habitat loss, extreme poaching and inadequate conservation plans set by governments (Dinerstein et al., 2007). In the past one-hundred years, scientists have seen three, possibly four, tiger subspecies face extinction. Originally, there were nine subspecies of tigers; however, three have become extinct in the last century, and one is likely extinct in the wild but has not been officially listed as extinct by the International Union for the Conservation of Nature (IUCN, 2014). According to the IUCN (2014), the Bali tiger was the first of the tiger subspecies to succumb to extinction during the 1940's due to habitat loss, prey loss and poaching. In the 1970's, two other tiger subspecies also became extinct: the Caspian tiger and the Javan tiger. The Caspian tiger most likely went extinct in the early 1970's for the same reasons as the Bali tiger. In the late 1970's the Javan tiger was considered extinct

because the last time it was observed in the wild was 1976. This subspecies also faced habitat loss, prey loss and poaching (IUCN, 2014). Unfortunately, the South China tiger has most likely also become extinct since there have been no recorded sightings since the 1970's (IUCN, 2014).

The remaining tiger subspecies still face poaching, habitat loss and prey loss, but now they also have to face the dangers of climate change. If conservation efforts continue to be unsuccessful, the five remaining tiger subspecies will likely face the same fate. There have been numerous studies and reviews on tiger conservation in regards to remedying habitat loss, prey loss and poaching. However, there is a lack of resources discussing how climate change is affecting tigers. This review will look at how different issues tigers face are exacerbated by climate change, current tiger conservation research and data, and what actions need to be taken to save this flagship species from extinction.

How Climate Change Affects Tigers (*Panthera tigris*)

Habitat Loss

All tigers have experienced habitat loss and habitat fragmentation as a result of constant encroachment destruction by humans. Currently, all tigers only occupy 7% of their historic range (Dinerstein et al., 2007).

With effects of climate change increasing, habitat for tigers will become more scarce. The Amur tiger (*Panthera tigris altaica*) is one subspecies that is already experiencing the challenges of habitat loss due to climate change. Amur tigers reside in the far east of Russia and northeastern China, which are both expected to be warmer and drier in coming decades (Lapen et al., 2005).



It is an area of concern because this region is the most biodiverse at that latitude worldwide (Tiang et al., 2011; Tiang, Wu, Wang and Ge, 2014). As a keystone species for this region, the health of the Amur tiger population says a lot about the health of the rest of the species that reside there. Throughout the past century, the Amur tiger population has decreased from 3,000 individuals to less than 600 (Tiang et al., 2011; Tiang et al., 2014). One study looked at three different potential climate change scenarios in relation to suitable habitat for Amur tigers, which would include low human density and a lot of shelter provided by Korean pines (Tiang et al., 2011; Tiang et al., 2014). In the least severe of the scenarios, research found that the Amur tiger would only be able to survive for another 100 years (Tiang et al., 2011; Tiang et al., 2014). Throughout the next century, with continued climate change, the Amur tiger population can only persist if their current habitat remains stable (Tiang et al., 2011; Tiang et al., 2014).

Another subspecies of tiger affected by climate change is the Bengal tiger (*Panthera tigris tigris*). The Bengal tiger resides in the Sundarbans mangroves in Bangladesh, which have been undergoing drastic changes due to climate change. Sea level is on the rise, and research predicts that by the year 2050 the sea level will have risen 0.3- 0.5 m above the year 2000 sea level, which was used as a baseline for this study (Loucks, Barber-Meyer, Hossain, Barlow & Chowdhury, 2009). Once the sea level rises 0.28 m the Sundarbans mangroves will be almost completely underwater causing the Bengal tiger and numerous of other plants and animals to lose their habitat (Loucks et al., 2009). The Bengal tiger will also be forced to find fresher water sources. As the sea level rises the salinity of fresh water will increase (Haque et al., 2015). A decrease in the habitat and water available to tigers will cause an increase in competition and relocation (Haque et al., 2015). In a 2010 survey, it was estimated that a population of 1,706 Bengal tigers remained (Jhala, Qureshi & Sinha, 2011), but without the Sundarbans mangroves it is predicted that the Bengal tiger population will drop sharply. The population of Bengal tigers drops to under 50 individuals once the sea level rises 24 cm (0.24 m), and with predictions showing that by 2050 the sea level will have risen 0.3 m, the Bengal tiger population is in grave danger of extinction in the next 30 years or so (Loucks et al., 2009).

Behavioral effects

Bengal tigers have struggled to adapt to the changing environment, and are being forced to search for new territory to occupy. They have to deal with their prey relocating and becoming scarcer in the mangroves (Haque et al., 2015), they are coming closer to human settlements, which have caused an increase in human-tiger conflicts. Loss of prey due to loss of habitat has caused stray tigers to adopt human predation and livestock hunting behaviors (Haque et al., 2015). In 2010, tigers in the Sundarbans west forest division of Bangladesh attacked approximately forty people (Haque et al., 2015). Injuries and deaths by tigers have led the people in this region to believe tigers are the enemy and also causes them to participate in retribution killings, which in 2010, resulted in two tigers being killed (Haque et al., 2015). With tiger habitat being destroyed worldwide, tigers will have to continue to find new territory which might coincide with humans. Tiger behavior will continue to change as they adapt to their changing environment, and human and tiger killings may become more frequent in parts of the world unless climate change is halted.

Tiger Conservation

One of the most well known tiger conservation programs is conducted by the Association of Zoos and Aquariums (AZA). They have created a Species Survival Plan (SSP) for the Sumatran, Malayan and Amur tigers. This survival plan focuses mainly on anti-poaching efforts, habitat loss prevention and mitigating tiger-human conflicts (Harris, 2016). The SSP has also participated in capture and release programs for abandoned cubs or injured tigers.

Other conservation programs that focus on preserving tigers may involve breeding recommendations. A majority of zoos participate in exclusive breeding programs for tiger species. Breeding programs can be a vital part of saving the tiger species. Well managed captive populations can become a genetic reservoir for their wild counterparts, which could be the key to avoiding extinction in the wild (Luo et al., 2008). However, the United States cannot be the only country focused on keeping a rich genetic diversity for these species. All countries need to be involved, especially those that are populated by tigers.

In 2010, all countries that had any population of tigers met to form the Global Tiger Recovery Program (GTRP) in hopes of doubling the number of tigers by the year 2020 (Seidensticker, 2010). Currently, conservation efforts are focusing on working with communities to learn how to coexist with tigers and rewarding them for their conservation efforts (Seidensticker, 2010). Many tiger communities are in 49 Less-Developed Countries (LDC's) that make up just over 10% of the world's human population (Huq et al., 2004). These countries are important because they—and the biodiversity contained in those areas—will be the most impacted by climate change due to their locations in the tropics (Huq et al., 2004). There is a fund to help these countries adapt to climate change. As a requirement of these funds, programs have to address the economic poverty and gain local support for conservation by encouraging participatory engagement in creating a sustainable living (Huq et al., 2004). Other efforts being made by the GTRP consist of making the tiger the posterchild for Asian biodiversity conservation and focusing on finding tiger-friendly solutions that improve the quality of life for tigers and for humans (Seidensticker, 2010). To combat climate change, action



is also being taken to reduce carbon emissions by reducing the amount of logging and deforestation. Asia experiences a lot of deforestation which increases the amount of carbon emissions being produced from that continent (Seidensticker, 2010). Other strategies that are being used to preserve tigers are focused solely on habitat conservation. One study analyzed currently protected areas in Bangladesh and the success of tiger populations in those areas. The conclusion that was made was that protected areas themselves needed a stronger focus on management and protection (Ranganathan, Chan, Karanth, and Smith, 2008). Ranganathan et al. (2008), also suggest that there needs to be a greater emphasis on the places surrounding protected areas. If tiger conservation is able to focus on land management, community education, and sustainable living, tiger species have a fighting chance.

Conclusion

Climate change is now recognized as an issue worldwide. Not only are humans feeling the negative impacts on our economy and health, but it is also threatening wildlife. In particular, it is greatly exacerbating the challenges facing tiger survival, an animal that has been a flagship conservation species for years. Tigers have faced numerous challenges throughout the past century that have threatened their existence, including loss of habitat, prey depletion and poaching. Now tigers must adapt to an even bigger issue or they may not survive. Research has shown that tiger populations have been drastically declining over the past twenty years. Two of the most at risk tiger subspecies, the Bengal and Amur tiger, have habitats that are threatened by climate change. The Amur tiger faces loss of prey and shelter in the warmer and drier climate seen in far east Russia and northeastern China (Lapenist et al., 2005). The Bengal tiger faces the rising sea level, which is destroying the habitat and causing prey to relocate. Because of this the Bengal tiger has been forced to relocate farther inland and closer to human settlements. Studies have shown that human-tiger conflicts have increased because of the Bengal tiger being forced to search for new sources of prey (Haque et al., 2015). It is important to look at the behavior and habits of the Bengal and Amur tigers as they adapt to climate change. The behavior that is being displayed by the Bengal tigers may reflect future behavior of other tiger subspecies as they are forced to relocate. Avoiding and minimizing tiger-human conflict may play a vital role in the survival of this species. That is why it is important to work towards successful community-based conservation. Future research should focus on the changing behavior of not only the Bengal tiger but look into how other subspecies are reacting to the various threats.

Conservation efforts are fighting continuously to ensure that tigers do not become extinct. Current efforts focus on breeding programs and working with local tiger communities (Huq et al., 2004; Luo et al., 2008). All of these efforts are being improved and modified in hopes that the right combination is able to save this iconic species. While climate change may not be able to be reversed, it is crucial to make changes that will mitigate the effects. There is always more information that can be obtained to better prepare conservation strategies for tigers. Research and conservation strategies should be discussed frequently so that tigers are able to survive for centuries to come.

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Photo 1: The author with female Andean bears Coya and Suyana.

Photo 2: Zookeepers remove old bones from the African lion exhibit.



Bioparque Amaru: Conserving Ecuadorian Wildlife

Kathryn Juliano, Great Cats and Bears Keeper
Smithsonian National Zoological Park
Washington, DC

Ecuador is one of the most biodiverse areas in the world. It is considered part of a “biodiversity hotspot”, and the Andean ecosystem alone is home to over 20,000 different plant species (Mittermeier, 1998). Like many regions of the world, Ecuador's biodiversity is at risk. Habitat loss is a major threat to several species within the country, with a rate of 190,000 ha lost every year (de la Torre, 2012). The illegal wildlife trade is a major problem in Ecuador as well. Many animals are taken and sold for their meat, and the bushmeat trade has been increasing as access into the Amazon improves (Suárez, 2009). Thousands of other animals are removed from their habitats and sold in the illegal pet trade. Some animals remain in Ecuador, but others are sold internationally, most often to parts of North America. It is difficult to determine how many animals are traded, but the Ecuadorian Ministry of Environment confiscated 6,878 animals between 2003 and 2008 (de la Torre, 2012). In 2013, the Ministry seized 634 individual animals (Ministerio del Ambiente, 2013). These confiscated animals need somewhere to go; in most cases, they are either released into protected areas or placed in wildlife refuges (de la Torre, 2012). Bioparque Amaru is one of the wildlife refuges that has taken in many different animals from the government.

I had the opportunity to visit Bioparque Amaru in Cuenca, Ecuador, for a week in April 2017 and learn about their facility. Technically, Amaru is a zoo located in the Andes Mountains in Southern Ecuador. It houses between 700 and 1,000 animals, most of which are rescues that were given to the facility by the government. While I stayed at the zoo, I assisted with large carnivore enrichment, training, and husbandry, and learned about how the zoo functions. Bioparque Amaru has a unique design and mission that has been highly influenced by the conservation issues in Ecuador, especially the illegal pet trade. By creating naturalistic enclosures for rescued Ecuadorian species, educating the public on conservation issues, and participating in

conservation research and breeding, Bioparque Amaru serves as a role model of a zoo that works to solve its country's conservation problems.

Most of the animals at Amaru are rescues that were brought to the zoo by the government. Some animals were purchased or kept in Ecuador as pets, including an ocelot that was purchased at a local market when a child believed it to be a domestic cat. Two baby woolly monkeys were both brought on to the zoo after being seized as illegal pets. Both of these babies were only weeks old when they were confiscated, and needed extensive human care. Other animals were kept for entertainment, like Coya, the Andean bear that was an attraction in a hotel lobby. Three of the zoo's African lions were confiscated from a local circus, where they were declawed. Some animals were wild, but had to be brought to the zoo because humans harmed them, like two of the zoo's Andean condors. One of the condors had to have a partial wing amputation, while another has over 40 lead bullets in its body; both birds could never survive in the wild again. Not every animal that reaches Amaru stays at the zoo; some local amphibians, birds, and reptiles may be released after being rehabilitated. The government also asks Amaru to hold some animals before they can be brought to a different facility. However, once it is determined that an animal cannot be released, the zoo is tasked with caring for the rescued animals.

While Amaru takes in many rescued species, including African lions, the zoo almost exclusively holds native Ecuadorian species. The exhibits are organized by biomes within Ecuador. There are sections within the zoo for the cloud forest in the Andes Mountains, the dry Sierra region, the jungles within the Amazon rainforest, and the unique Galapagos Islands. Because the collection mainly contains native species, the zoo is able to educate visitors about the diversity and importance of Ecuador's ecosystems. Ecuadorian visitors are able to learn about their country's wildlife and see animals that may live in their own backyard. The zoo often hosts specific groups of visitors from rural areas that have had conflict with native species, such as Andean bears and mountain lions. Some visitors have never seen these animals before, and the trips help remove fear and anger towards these species. Foreign visitors are also able to learn about Ecuadorian species, and see the wide range of biodiversity that exists within one country.

Amaru cares for most of these animals in large, naturalistic enclosures. The zoo is built into the side of the mountain, so exhibits often include a lot of vertical height and natural vegetation. Alterations are designed to appear natural; most animal buildings are made from a combination of concrete and mud, which is applied by hand to create a rock-like appearance. Pools and dens are often made from the same material, and dens and structural components of the exhibits utilize timber harvested within the park. Guest features are very naturalistic as well. Dirt hiking trails are the only paths through the zoo, and fences along the paths are made from the branches of local trees. The entire effect makes one feel as if they were just hiking through the mountain and happened upon native wildlife. These large enclosures provide a good quality of life for the rescued animals that came from varied backgrounds. The natural design also connects visitors to the animals' natural behaviors and environment, and opens a door to begin talking about conservation issues, including deforestation and the illegal pet trade.

Extensive signage accompanies the exhibits throughout the zoo and connects a strong conservation message to most enclosures. Some signs teach the public about various species and biomes within the zoo. Almost every exhibit has a sign with information about the species' diet, distribution, and natural behaviors. At the Amphibian Conservation Center, there are images of the variety of amphibians in the collection, and information about the conservation threats to the different species. Adjacent to the Andean condor exhibit, there is a graphic that compares wingspans of large condors and raptors. Other signs focus specifically on conservation issues within Ecuador. A set of signs by the picnic pavilion in the zoo depict exotic animals as pets and explain issues caused by the illegal pet trade in Ecuador. Other signs describe the effects of habitat loss and fragmentation to local environments. Parts of the zoo are also designed specifically to encourage conservation actions. One "exhibit" within the zoo is a "burned forest" that was destroyed as a consequence of declining environmental quality. The area has fallen trees, fake charred animal bones, and images of clear-cut forests. Adjoining signage provides visitors with ways to make better environmental choices and help protect the local environment. The zoo's variety of informational signs and graphics create a strong connection between the species at the zoo and conservation issues.

The zoo also actively participates in and educates the public about conservation efforts, especially with native amphibian species. The zoo has an Amphibian Conservation Center on its grounds that contains many endangered Ecuadorian species. Some amphibians are kept in only a few facilities in the world, and some species were discovered in the surrounding area by zoo employees. The center works on studying, researching, and breeding these endangered and somewhat unknown amphibian species, with funding and support from the government. Some species are bred in order to improve husbandry practices and gain more information about the amphibians' natural behaviors. Other species are bred for reintroduction programs, and Amaru

Photo 3: A female tapir stands in a sunny spot in her exhibit.





Photo 4: A sign demonstrating the variety of amphibian species kept at Bioparque Amaru.



Photo 5: A sign adjacent to the Blue Footed Booby exhibit provides information about the species' distribution, diet, and other characteristics.

releases many amphibians that are native to the Andes Mountains surrounding Cuenca. The Center is one of the few facilities in the Ecuadorian Andes that focuses on native amphibian research and conservation.

The zoo focuses on conservation and research programs for other native Andean species as well. The zoo has bred their Andean bears in order to gain more knowledge about Andean bear husbandry and breeding. Their research has led to successful births and the creation of an Andean bear husbandry guide. The zoo also works on Andean condor conservation programs. They assist with *in-situ* conservation programs in the local area, and they work with other zoos in Ecuador to plan condor breedings between facilities. At the time of writing, there are 17 Andean condors in Ecuadorian zoos, and an estimated 100 wild Andean condors in Ecuador. Through planning and communication with other facilities, Amaru hopes to successfully breed Andean condors and potentially

Bioparque Amaru has connected its visitors to conservation issues through their natural enclosures and educational signage.

reintroduce individuals to the Andes Mountains. Amaru works to research, breed, and conserve Ecuadorian species.

It is crucial to involve local populations in conservation efforts (de la Torre, 2012). Bioparque Amaru has connected its visitors to conservation issues through their natural enclosures and educational signage. The zoo also directly works to help solve the illegal wildlife trade by providing homes for confiscated animals. Finally, Amaru supports local conservation efforts, including *in-situ* research projects, and completes research on threatened and endangered species within their zoo. Bioparque Amaru is a zoo that is truly working to solve their country's environmental problems.

I am deeply grateful to the staff and animals of Bioparque Amaru for letting me work and stay with them for a week. Several zoos and animal care facilities throughout South America offer animal keeper exchange programs. If you are interested in volunteering with or visiting Bioparque Amaru, or have any questions, please contact me at julianok@si.edu.

Photo credit: Kathryn Juliano

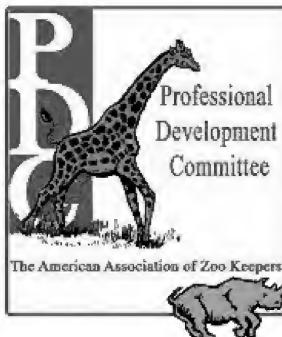
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AAZK Professional Development Committee Second Call for Papers and Posters

**The 45th Annual AAZK National Conference
Rocky Mountain AAZK Chapter, Denver, CO
October 4-8, 2018**

Conference Theme: "Adjust your Altitude"

First Call for Papers and Posters

The AAZK Professional Development Committee is pleased to announce the second call for papers and posters for the 2018 National AAZK Conference hosted by Rocky Mountain AAZK Chapter. The Host Chapter has chosen the theme "Adjust Your Altitude", which will highlight innovations in animal care, professional development, and conservation.

Deadline for Submission of Abstracts for Papers and Posters: 1 May 2018

Authors will be notified regarding acceptance by 1 June 2018.

How to Submit Your Abstract for Consideration:

- Go to the 2018 conference website
- <http://aazk2018.webs.com/workshops-papers-posters>
- Download the Application for either poster or paper
- Fill out completely and submit to pdc@aazk.org no later than May 1st

NOTE: If you do not use the application, your abstract will not be reviewed.

Papers

Papers should focus on the conference theme including innovative approaches in the areas of husbandry, animal welfare, conservation, education, enrichment and training.

Authors will be allowed 15 minutes for a presentation with five minutes of Q&A immediately following.

Posters

Posters will be on display throughout the Conference with a scheduled Q&A session with the author, time to be determined. Posters will be judged by members of AAZK PDC on criteria such as adherence to the conference theme, innovation, and poster layout and organization. Certificates will be awarded to winning posters at the designated Poster Session.

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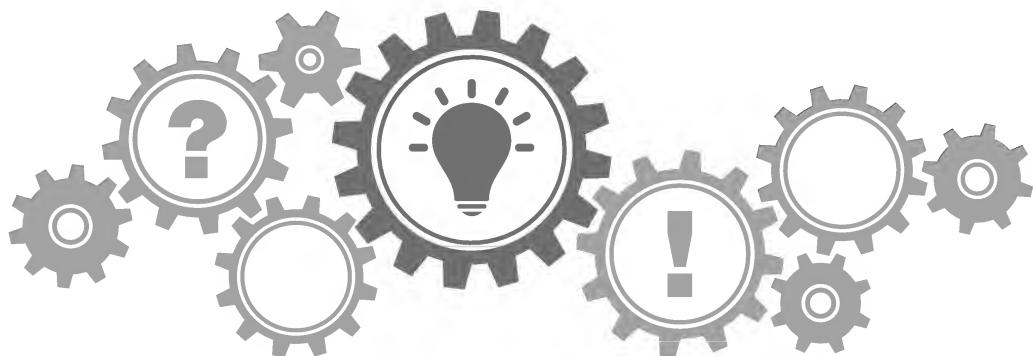
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How to Love Your Dream Job

Many of us will spend years trying to determine how we want to spend our days. What will truly bring us happiness, and is there a way that this happiness can better the world. How can we leave our footprint, walking away leaving the world better for having us.

Zoo keeping is or was the answer for many of us, checking off all the boxes to a happy life with the dream job. Only thing is, it's never that simple. Many of us spend years chasing the dream, and then years later questioning its reality.

Heather Kalka • Grade 4/Lead Keeper • Canadian Domain Toronto Zoo



So how do you keep loving your dream job?

We often find ourselves becoming frustrated within our careers because they are simply no longer checking off all the boxes we thought they would. By taking the time and putting your personal goals to paper you can help create a map to your own happiness. This will give you the power to move forward with intent and more importantly direction.

Take the time to reflect on them from time to time and reassure yourself that you are moving in the right direction. This could be anything. Perhaps you want to start your own conservation program, or move up within your organization? With a sense of direction you can start determining what you need to do to ensure you remain true to your goal. If you have a vision then you hold the key! Sign up for those courses (even if it is just one) and take back the responsibility of making yourself happy!

Remember to check your vision and mission statements against your personal life. Make sure they are in line and a reflection of one another. I don't mean bring work home with you, or your personal life to work, but remember you are the center of both those worlds so be sure they are leading you down the same path.

TIPS

1

Never lose sight that sometimes work will be hard, it will challenge you both mentally and physically. However, you always have the choice to make the best of it. Often the hardest times, and moments we find ourselves on the verge of giving up is where we gain the most experience. It is what pushes us to grow and become better. It is these experiences that mold us into even stronger and more passionate individuals.

2

At the end of the day be happy with what you have accomplished. You are the only person who truly knows if you tried your best. And if at the end of the day you know you did all you could, and were the best you could be, take a moment and let yourself take pride in just that.

3

No one ever intends to not do their best! Remember that just because they took longer or didn't do it as well as you or maybe didn't even finish, doesn't mean they didn't do their best! We all have something unique to offer so instead of offering judgement try offering help!

4

Be aware of your co-workers and how they are doing. There is often a lot more to the people we spend our days with than we realize. Often times if they are struggling there is a reason, even if they don't want to share what it is.

5

People may need help but are afraid to admit it, so why not simply help them out without expecting anything back, including praise. Do it for them, not for your own ego.

6

We often feel that if something goes wrong for us it's because the world is against us, and that when something goes right it's because we worked hard and earned it. Why should it be any different for your co-workers? Just because they got something you wanted doesn't mean they got lucky or someone favors them; perhaps they worked just as hard OR even maybe just a little harder for it?

7

Surround yourself with people who you admire and respect. It is easy to lose sight of how easily our moods are impacted by those around us, even our work ethic. Try to avoid those you find draining or are forever bringing you down. By working with those you admire you will both move forward together, pushing each other to become even better

8

Be aware of yourself, and try to understand the impact you have on others around you. As mentioned above, we all have the power to alter a person's day; be sure you leave them better for having seen you.

9

There is inspiration all around you. Although conferences can be inspiring so can your own co-workers! Why not invite another area for coffee or lunch? Create an opportunity to be inspired by what's happening within the walls of your own facility! You might just be surprised!

I know that these may seem like basic practices, but they are often forgotten and lost. We need to remember why we started down this road. You need to take back control of your own happiness and your own path. Be everything you can be and more! Let yourself surprise yourself and all that you can do!

Don't fall victim to the roadblocks and red tape or nay-sayers. It takes people like you to change and make your zoo the best it can be! If you stop fighting for that vision than you are simply the same as everyone else that gave up years or days before you. It just takes one to lead the way! Others will soon follow, and be grateful that you were there! Good luck! And for what it is worth I am cheering for you!

Injection Training 3.0 Alpacas at the Smithsonian National Zoo

Kathryn Juliano, Great Cats and Bears Keeper
Smithsonian National Zoo
Washington, DC

The Kids' Farm at the Smithsonian's National Zoo is home to a variety of domestic animals including three male alpacas (*Vicugna pacos*) named Cirrus, Orion, and Ziggy. Every month our alpacas receive injections of the dewormer Ivermectin. In the past, we have physically restrained our alpacas to inject them, which often results in stressful behavioral reactions from the animals. I decided to try to train the alpacas for voluntary injections in order to reduce their stress and make the injections easier for the animals and staff members.

I began my plan in January 2016. I decided to use the yard's patio as my training location, as I could isolate individual alpacas and separate them from the cows that also lived in the yard. From January to March 2016, I worked on getting the alpacas to shift in and out of the patio. I called them to the patio by showing them a cup full of treats, which was a cue the staff had previously used. Once I isolated an alpaca, I would reward them for being alone in the patio by tossing them food or feeding them from my hand. I approximated to only rewarding them when they approached me. I also spent time associating my verbal bridge "good" with a reward, typically a small piece of carrot or sweet potato.

In March 2016, I began desensitizing the alpacas to touch. I had the alpacas face me while I would say "touch" and touch their necks. If the alpacas allowed me to touch while staying still and calm, I would give my verbal bridge and then reward them. I planned to approximate touches along their neck and back until I reached the injection site on their hip, and so I began touches on their backs as well. After this point in the training, I

never touched or attempted to touch the alpacas at any other time, even outside of training sessions, which helped create trust between us. Through these first steps and the whole process, each alpaca progressed at their own pace.

However, by June 2016 I began to realize that my plan was much too complicated. I would have to complete many steps to approximate touches all the way to the injection site on their hips. I would also need to have them stand in a different position so I could easily reach their hip. At this time, I gained the help of a training mentor. Gen Warner is a professional trainer and a volunteer at our zoo who worked with me on my training plan. She taught me numerous training concepts and supported me through the inevitable challenges that came up during my project.

In July 2016, we started over again by changing the plan. I would train the alpacas to line up perpendicular to my body, begin by touching them at the injection site instead of approximating touches along their body, and work towards having the alpacas lean in to the injection. I would also have them stand between me and a door with large mesh. If the alpacas were too nervous with another person on the patio, a veterinary technician could give the injection through the door. At the time, restarting the plan felt like a huge loss of progress, but Gen helped me realize that this was the best course of action. She pointed out that I had already made progress desensitizing the alpacas and she taught me that changing a training plan is normal.

By November 2016, all three alpacas had learned to line up between me and the

Photo 1: Three male alpacas at the Smithsonian's National Zoo. Left to right: Ziggy, Cirrus, Orion.





Photo 2: The alpacas share a touch yard with cows during the day.



Photo 3: I initially worked with the alpacas in this position, which left me far away from the injection site.

door. I began the process by rewarding them when they approached me, then only rewarding them as they got closer between me and the door. Gen taught me to tighten my criteria so that they stopped in the right place, stood still, and lined up without a verbal cue. By March 2017, all three alpacas lined up between me and the door without hesitation and accepted strong touches with my finger or a pointy object. They would also accept touches from a second person on the patio, although some of the alpacas were hesitant to enter

the patio if another person was present at the beginning of the session.

In April 2017, Gen and I began planning a training demonstration for the AAZK conference in August, and so I began training the alpacas in various locations within the exhibit. I learned that the "line up" behavior was so strong that the alpacas would line up almost anywhere in their exhibit. I also abandoned any plans to have someone inject through a door, as they were comfortable enough with

other people. In June 2017, I also saw the alpacas receive their monthly injection calmly and without much restraint. While I had planned to formally arrange training sessions with the veterinarians, I realized that my training had worked to desensitize the alpacas to touch and to other people. My original goal has been met, although differently than I expected, and monthly injections are no longer a major source of stress for our alpacas.

This training plan successfully reduced stress in our alpacas caused by their monthly injections. I gained valuable skills and experience through my first major training project. I learned how to work through challenges, adjust my training plan, and take constructive criticism. I also learned how beneficial it can be to work with a mentor, and I recommend that other beginning trainers find a mentor in their own facility.

In the future, I will continue training our alpacas in order to improve their lives. My next plan is to use the "line up" and "touch" behaviors as an interactive demonstration and to train additional husbandry behaviors. After I completed this project, one of our alpacas, Ziggy, unfortunately passed away. While it was sad to say goodbye, I took comfort in the fact that I improved his life, and I am more motivated now to improve my training skills and help animals through training.

Photo 4: In this position, I could reach the injection site while reinforcing the alpacas. A veterinary technician could inject the alpacas next to me or through the mesh door.



We want to hear your Training Tales: the good, the bad and the fabulous!

Did you enjoy the latest Training Tale? Was this information useful or inspiring? Do you have any operant conditioning experiences that others would benefit from reading? Please submit your "Training Tales" and experiences in operant conditioning to share with *Animal Keepers' Forum* readers. This opportunity provides a convenient outlet for you to exhibit your training challenges, methods and milestones with the AAZK member network. Please submit entries based on the following guidelines:

- a. Submit a brief description of a training project at your facility. These can be 500 words or less, in text or bullet points – it can be longer (up to 1000 words); however, short and simple descriptions with a few images are just as perfect. Details should include the following:
 1. Define the training goal (what did you try to do and for what purpose?)
 2. List important steps (How did you do it – include plans that changed along the way/what worked and what didn't work)
 3. Timeline used (how long did it take)
 4. Tips you learned along the way
- b. Include 3-5 digital photos that clearly depict the animal in the learning process or performing the desired goal (provide photo caption and photographer of each image). Photos need to be 300 dpi and at least 1200 x 1800 pixels.

PLEASE SEND SUBMISSIONS OR QUESTIONS TO:

Kim Kezer at
kkezer@zoonewengland.com
or
Shane Good at
shane.good@aazk.org
(use Training Tales Submission
as the subject).



Photo 5: The alpacas are now willing to accept touches from complete strangers, as shown during this demonstration at the AAZK Conference in 2017.



Training Tales Editorial By Angela Binney, Training Tales Column Coordinator

This tale is a fabulous demonstration of the learning process that takes place in us as we venture into a new project. While it is important to develop a detailed training plan before starting a new project, it is equally important to be flexible while moving through that plan as we see what is working and where adjustments are needed. Having a mentor or partner to work through the plan is useful for both new and experienced trainers in that we can gain valuable feedback and ideas. In addition to providing their own perspective, a mentor tends to ask questions to gain understanding of our situation which often prompts us to evaluate the details as we work to explain them. This can lead to a deeper understanding of the animals and how we work with them.

Even if a more experienced trainer is not available to serve as a mentor, partnering with a teammate is also valuable for several reasons. Having someone observe our sessions and provide feedback can be really beneficial as the observer might see things that we might miss from our own vantage point. Having a training partner present during sessions allows the animals to become desensitized to the presence of multiple people which, in most cases, is needed to accomplish training goals such as medical procedures. Lastly, if we share our training journey with a teammate, we can develop a training program with longevity that provides behavioral management tools the whole team can use. Thank you for sharing your training tale and best wishes in your alpaca training adventures!

Bowling for Rhinos

Update

Kate Clemens
Bowling For Rhinos Program, Communication Liaison

The Bowling for Rhinos Program cannot thank all our members enough. This was the restructured BFR Program's first year and we are elated that YOU raised over \$600,000! Thank you to everyone who participated.

We would love for all AAZK Chapters to participate this year so we can reach our goal of \$700,000 for 2018. Remember that events don't have to be limited to bowling, many Chapters hold varying themed events to benefit BFR's conservation initiatives. If you cannot attend an event, please consider donating to BFR directly through the link on the website.

For AAZK Chapters that are planning to hold an event, remember that the event **MUST** be sanctioned. The 2018 sanctioning occurs by sending a \$50 fee to National AAZK headquarters. Not only does the sanction fee cover all the administration costs so that AAZK can continue to donate 100% of funds raised to conservation, but this year every Chapter that registers is entered to win the beautiful quilt pictured to the right. The Chapter that wins the quilt will be able to auction it at their future BFR event in 2019.

All checks must be made payable to AAZK. Once your fee has been collected you will receive your BFR Kit.

Sanctioning fee can be sent to:

AAZK Office
8476 E Speedway Blvd. Suite 204
Tucson, AZ 85710

Is there a member of your Chapter who has gone above and beyond for Bowling for Rhinos?

Consider nominating them for The Anna Merz Champion Award! The Anna Merz Champion (AMC) Award process has now been revised. The AMC Award commemorates the late Anna Merz, the co-founder of Lewa and Rhino Champion. This award will be granted to a randomly selected nominee who has demonstrated passion and dedication to AAZK's Bowling for Rhinos. To qualify the nominee must be a AAZK member in good standing who has been involved with sanctioned BFR events for at least three years. The nominee may not be a previous recipient of the AMC award or have been awarded a previous BFR or IRF trip as one of the highest fundraisers. Committee Chair or Vice Chair, Program Manager or Vice Manager, or members of the AAZK BFR Program or a current member of the AAZK Board of Directors **CANNOT** be nominated. Nominations are open from January 1st to August 1st. To send in nominations or for questions, please contact conservation@aazk.org.



The BFR Program is comprised of five members:

Carol McCallum
BFR Manager

Kym Janke
BFR Vice Manager

Kevin Shelton
Conservation Coordinator

Lisa Haggadone
Events Coordinator

Kate Clemens
Communications Liaison



QUESTIONS?

CONTACT
Kym Janke at
kym.janke@aazk.org.

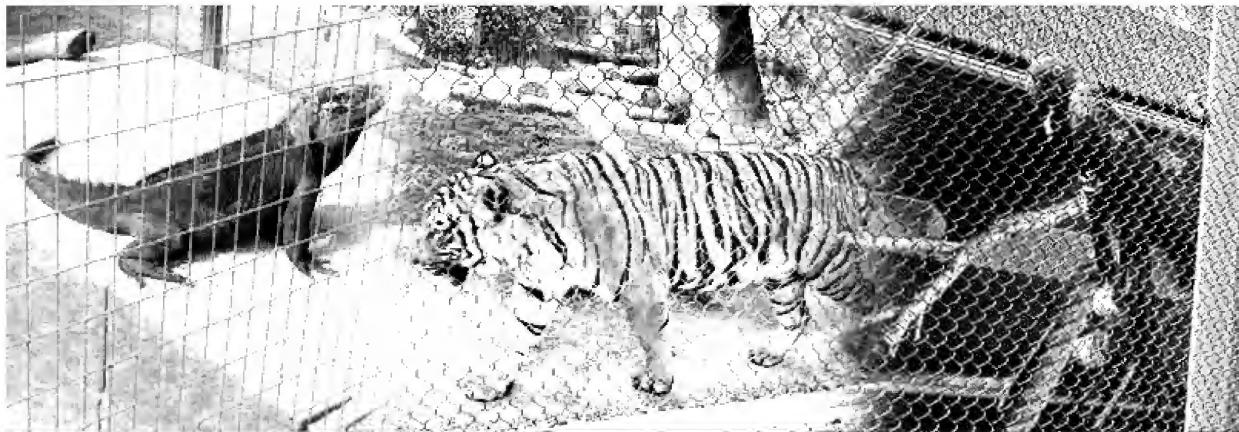


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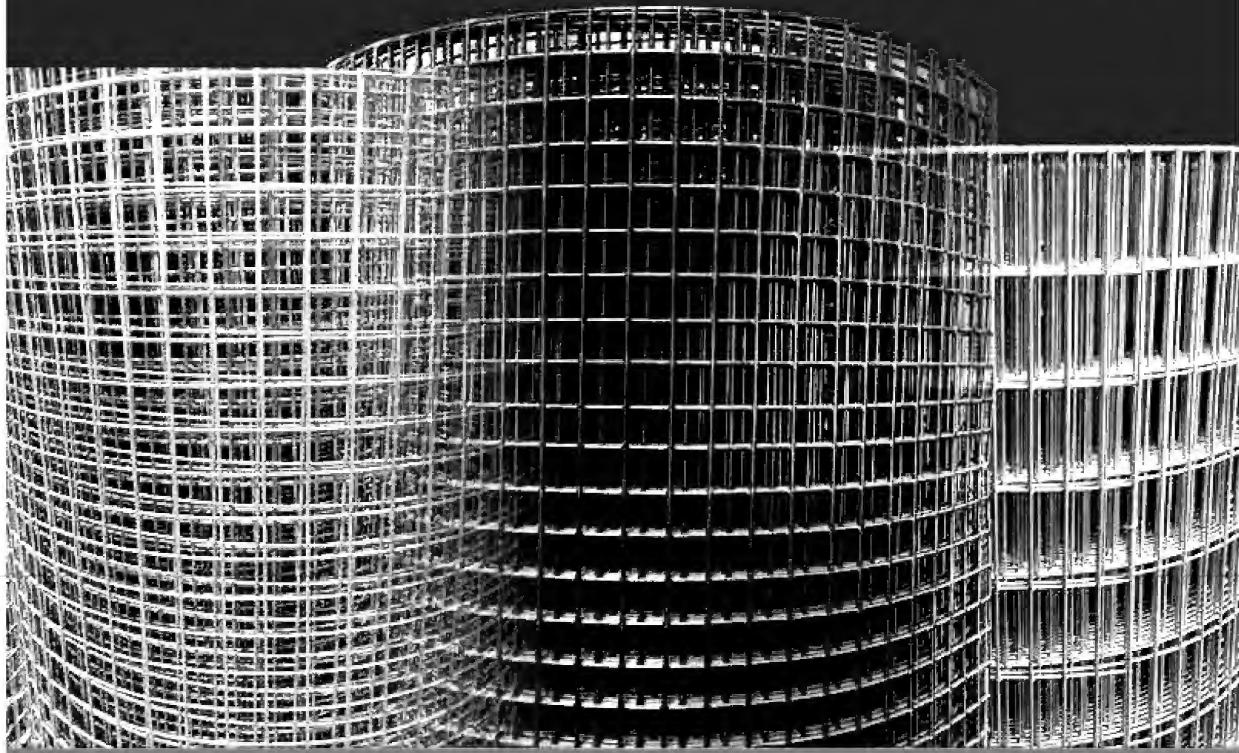
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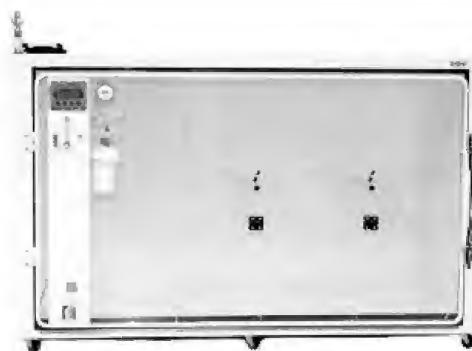
ProCare CCU 36: 40 1/4 W x 27 H x 23 D P/N 912-104

ProCare CCU 48: 52 1/4 W x 33 H x 25 D P/N 912-140

ProCare CCU 60: 66 1/4 W x 39 H x 31 1/2 D P/N 912-119

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